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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/502,045	01/10/2005	Atsushi Kudo	255291US90PCT	2143
22850 7590 02/12/2009 OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER YOUNG, NATASHA E				
ART UNIT 1797		PAPER NUMBER		
NOTIFICATION DATE 02/12/2009		DELIVERY MODE ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/502,045

Applicant(s)

KUDO ET AL.

Examiner

NATASHA YOUNG

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-6, 10-12, 16 and 32-46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4-6, 10-12, 16 and 32-46 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 4-6, 10-12, 16, and 32-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Naruse et al (US 5,914,187) in view of Ito et al (EP 0 361 883 A1).

Regarding claims 4 and 32, Naruse et al discloses a honeycomb filter for purifying exhaust gases (see column 10, lines 16-23), comprising: a plurality of columnar porous ceramic members having a partition wall and plurality of through holes, said through holes extending in parallel with one another in a length direction of said columnar porous ceramic members, said partition wall separating said through holes and configured to filter particulates in an exhaust gas, said through holes of each said columnar porous ceramic members including ones sealed at an inlet side of said columnar porous ceramic members and ones sealed at an outlet side of said columnar porous ceramic member such that the exhaust gas enters from the inlet side, passes through the partition wall and flows out from the outlet side; and an adhesive layer combining said columnar porous ceramic members with one another (see Abstract and figures 1 and 2).

Naruse et al does not disclose an adhesive layer having a plurality of pores adjusting a thermal capacity per volume of said adhesive layer is lower than a thermal capacity per unit volume of the porous members and said plurality of pores is formed by incorporating a material which forms independent pores in adhesive layer.

Ito et al discloses the Young's modulus bonding material (adhesive) can appropriately be adjusted by adding into the bonding material a given amount of a foaming agent which forms pores after firing (see page 3, lines 18-23) such that said

plurality of pores is formed by incorporating a material which forms independent pores in adhesive layer.

Because Ito et al discloses an adhesive layer comprises a foaming agent which forms pores after firing, Ito et al inherently discloses an adhesive layer having a plurality of pores adjusting a thermal capacity per volume of said adhesive layer to lower than a thermal capacity per unit volume of the porous members.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Naruse et al with the teachings of Ito et al to prevent stress concentration upon the bonded portions and for thermal shock resistance (see Ito et al reference page 2, lines 52-54).

Regarding claim 5, Naruse et al does not disclose the thermal capacity per unit volume of the adhesive layer is set to 90 % or less of the thermal capacity per unit volume of the porous ceramic members.

Because the materials of the adhesive and the plurality of columnar porous ceramic members taught in Naruse et al are also taught in the claimed invention, Naruse et al also discloses the limitation of the adhesive layer is set to 90% or less of the thermal capacity per unit volume of the porous ceramic members.

Regarding claim 6, Naruse et al does not disclose the thermal capacity per unit volume of the adhesive layer is set to 20% or more of the thermal capacity per unit volume of the porous ceramic members.

Because the materials of the adhesive and the plurality of columnar porous ceramic members taught in Naruse et al are also taught in the claimed invention,

Naruse et al also discloses the limitation of the adhesive layer is set to 20% or more of the thermal capacity per unit volume of the porous ceramic members.

Regarding claim 33, Naruse et al does not disclose said material comprises at least one material selected from the group consisting of a foaming agent, inorganic balloons and organic balloons.

Ito et al discloses said material that is capable of forming independent pores comprises at least one material selected from the group consisting of a foaming agent, inorganic balloons and organic balloons (see page 3, lines 18-19).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Naruse et al with the teachings of Ito et al to prevent stress concentration upon the bonded portions and for thermal shock resistance (see Ito et al reference page 2, lines 52-54).

Regarding claim 34, Naruse et al discloses a catalyst supported in at least one of said columnar porous ceramic members (see column 8, lines 35-39).

Regarding claims 10 and 35, Naruse et al discloses a honeycomb filter for purifying exhaust gases (see column 10, lines 16-23), comprising: a ceramic block comprising at least one columnar porous ceramic member having a partition wall and plurality of through holes, said through holes extending in parallel with one another in a length direction of said columnar porous ceramic members, said partition wall separating said through holes and configured to filter particulates in an exhaust gas, said through holes of each said columnar porous ceramic members including ones sealed at an inlet side of said columnar porous ceramic members and ones sealed at an

outlet side of said columnar porous ceramic member such that the exhaust gas enters from the inlet side, passes through the partition wall and flows out from the outlet side (see Abstract and figures 1 and 2).

Naruse et al does not disclose a coating material layer formed on a circumferential face of said ceramic block; having a plurality of pores adjusting a thermal capacity per volume of said coating material layer is lower than a thermal capacity per unit volume of the porous members; and said plurality of pores is formed by incorporating a material which forms independent pores in said coating material layer.

Ito et al discloses the Young's modulus bonding material (adhesive) can appropriately be adjusted by adding into the bonding material a given amount of a foaming agent which forms pores after firing (see page 3, lines 18-23); coating material layer having the same components as the bonding material except the foaming agent (see page 3, lines 15-32); and the use of carbon powder and resin beads, which may be organic or inorganic (see page 3, lines 18-20).

Ito et al does not disclose the honeycomb structure used as a filter or the use of organic binder.

Because Ito et al discloses an adhesive layer comprises a foaming agent which forms pores after firing, Ito et al inherently discloses an adhesive layer having a plurality of pores adjusting a thermal capacity per volume of said coating material layer is lower than a thermal capacity per unit volume of the porous members.

It would have been obvious to add a foaming agent to the coating material layer, such that a plurality of pores is formed by incorporating a material which forms

independent pores in said coating material layer, from a finite number of identified, predictable solutions for ways of improving the coating material layer, i.e., it would have been "obvious to try" adding a foaming agent which forms pores after firing to enhance the coating material layer by the addition of pores, which would inherently adjust a thermal capacity per volume of said coating material layer is lower than a thermal capacity per unit volume of the porous members.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Naruse et al with the teachings of Ito et al to prevent stress concentration upon the bonded portions and for thermal shock resistance (see Ito et al reference page 2, lines 52-54).

Naruse et al discloses the honeycomb structures used as heat exchangers (see column 10, lines 16-23) and the organic only contributes 0.1-5.0 wt% (see column 4, lines 27-30) which would not contribute a large amount to the thermal coefficient of the adhesive.

Regarding claim 11, Naruse et al does not disclose the thermal capacity per unit volume of the coating material layer is set to 90 % or less of the thermal capacity per unit volume of the porous ceramic members.

Because the combined teachings of Naruse et al and Ito et al disclose the materials of the coating material layer and the ceramic block of the claimed invention, Naruse et al and Ito et al also disclose the limitation of the coating material layer is set to 90% or less of the thermal capacity per unit volume of the porous ceramic members.

Regarding claim 12, Naruse et al does not disclose the thermal capacity per unit volume of the coating material layer is set to 20% or more of the thermal capacity per unit volume of the porous ceramic members.

Because the combined teachings of Naruse et al and Ito et al disclose the materials of the coating material layer and the ceramic block of the claimed invention, Naruse et al and Ito et al also disclose the limitation of the adhesive layer is set to 20% or more of the thermal capacity per unit volume of the porous ceramic members.

Regarding claim 36, Naruse et al does not disclose said material comprises at least one material selected from the group consisting of a foaming agent, inorganic balloons and organic balloons.

Ito et al discloses said material that is capable of forming independent pores comprises at least one material selected from the group consisting of a foaming agent, inorganic balloons and organic balloons (see page 3, lines 18-19).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Naruse et al with the teachings of Ito et al to prevent stress concentration upon the bonded portions and for thermal shock resistance (see Ito et al reference page 2, lines 52-54).

Regarding claim 37, Naruse et al discloses a catalyst supported in ceramic block (see column 8, lines 35-39).

Regarding claims 16, 40, and 44, Naruse et al discloses a honeycomb filter for purifying exhaust gases (see column 10, lines 16-23), comprising: a ceramic block comprising a plurality of columnar porous ceramic members having a partition wall and

plurality of through holes, said through holes extending in parallel with one another in a length direction of said columnar porous ceramic members, said partition wall separating said through holes and configured to filter particulates in an exhaust gas, said through holes of each said columnar porous ceramic members including ones sealed at an inlet side of said columnar porous ceramic members and ones sealed at an outlet side of said columnar porous ceramic member such that the exhaust gas enters from the inlet side, passes through the partition wall and flows out from the outlet side; and an adhesive layer combining said columnar porous ceramic members with one another (see Abstract and figures 1 and 2).

Naruse et al does not disclose a coating material layer formed on a circumferential face of said ceramic block; an adhesive layer having a plurality of pores adjusting a thermal capacity per volume of said adhesive layer is lower than a thermal capacity per unit volume of the porous members; a coating material layer having a plurality of pores adjusting a thermal capacity per volume of said coating material layer is lower than a thermal capacity per unit volume of the porous members; having a plurality of pores adjusting a thermal capacity per volume of said coating material layer is lower than a thermal capacity per unit volume of the porous members; said plurality of pores is formed by incorporating a material which forms independent pores in said adhesive layer; and said plurality of pores is formed by incorporating a material which forms independent pores in said coating material layer.

Ito et al discloses the Young's modulus bonding material (adhesive) can appropriately be adjusted by adding into the bonding material a given amount of a

foaming agent which forms pores after firing (see page 3, lines 18-23); coating material layer having the same components as the bonding material except the foaming agent (see page 3, lines 15-32); and the use of carbon powder and resin beads, which may be organic or inorganic (see page 3, lines 18-20) such that said plurality of pores is formed by incorporating a material which forms independent pores in adhesive layer.

Ito et al does not disclose the honeycomb structure used as a filter or the use of organic binder.

Because Ito et al discloses an adhesive layer comprises a foaming agent which forms pores after firing, Ito et al inherently discloses an adhesive layer having a plurality of pores adjusting a thermal capacity per volume of said coating material layer is lower than a thermal capacity per unit volume of the porous members.

It would have been obvious to add a foaming agent to the coating material layer, such that a plurality of pores is formed by incorporating a material which forms independent pores in said coating material layer, from a finite number of identified, predictable solutions for ways of improving the coating material layer, i.e., it would have been "obvious to try" adding a foaming agent which forms pores after firing to enhance the coating material layer by the addition of pores, which would inherently adjust a thermal capacity per volume of said coating material layer is lower than a thermal capacity per unit volume of the porous members.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Naruse et al with the teachings of Ito et

al to prevent stress concentration upon the bonded portions and for thermal shock resistance (see Ito et al reference page 2, lines 52-54).

Naruse et al discloses the honeycomb structures used as heat exchangers (see column 10, lines 16-23) and the organic only contributes 0.1-5.0 wt% (see column 4, lines 27-30) which would not contribute a large amount to the thermal coefficient of the adhesive.

Regarding claim 38, Naruse et al does not disclose the thermal capacity per unit volume of the adhesive layer is set to 90 % or less of the thermal capacity per unit volume of the porous ceramic members.

Because the materials of the adhesive and the plurality of columnar porous ceramic members taught in Naruse et al are also taught in the claimed invention, Naruse et al also discloses the limitation of the adhesive layer is set to 90% or less of the thermal capacity per unit volume of the porous ceramic members.

Regarding claim 39, Naruse et al does not disclose the thermal capacity per unit volume of the adhesive layer is set to 20% or more of the thermal capacity per unit volume of the porous ceramic members.

Because the materials of the adhesive and the plurality of columnar porous ceramic members taught in Naruse et al are also taught in the claimed invention, Naruse et al also discloses the limitation of the adhesive layer being set to 20% or more of the thermal capacity per unit volume of the porous ceramic members.

Regarding claim 41, Naruse et al does not disclose said material comprises at least one material selected from the group consisting of a foaming agent, inorganic balloons and organic balloons.

Ito et al discloses said material that is capable of forming independent pores comprises at least one material selected from the group consisting of a foaming agent, inorganic balloons and organic balloons (see page 3, lines 18-19).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Naruse et al with the teachings of Ito et al to prevent stress concentration upon the bonded portions and for thermal shock resistance (see Ito et al reference page 2, lines 52-54).

Regarding claim 42, Naruse et al does not disclose the thermal capacity per unit volume of the coating material layer is set to 90 % or less of the thermal capacity per unit volume of the porous ceramic members.

Because the combined teachings of Naruse et al and Ito et al disclose the materials of the coating material layer and the ceramic block of the claimed invention, Naruse et al and Ito et al also disclose the limitation of the coating material layer being set to 90% or less of the thermal capacity per unit volume of the porous ceramic members.

Regarding claim 43, Naruse et al does not disclose the thermal capacity per unit volume of the coating material layer is set to 20% or more of the thermal capacity per unit volume of the porous ceramic members.

Because the combined teachings of Naruse et al and Ito et al disclose the materials of the coating material layer and the ceramic block of the claimed invention, Naruse et al and Ito et al also disclose the limitation of the adhesive layer being set to 20% or more of the thermal capacity per unit volume of the porous ceramic members.

Regarding claim 45, Naruse et al does not disclose said material comprises at least one material selected from the group consisting of a foaming agent, inorganic balloons and organic balloons.

Ito et al discloses said material that is capable of forming independent pores comprises at least one material selected from the group consisting of a foaming agent, inorganic balloons and organic balloons (see page 3, lines 18-19).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Naruse et al with the teachings of Ito et al to prevent stress concentration upon the bonded portions and for thermal shock resistance (see Ito et al reference page 2, lines 52-54).

Claim 46 depends on claim 16 such that the reasoning used to reject claim 16 will be used to reject the dependent portions of the claim.

Regarding claim 37, Naruse et al discloses a catalyst supported in ceramic block (see column 8, lines 35-39).

Response to Arguments

Applicant's arguments filed December 28, 2008 have been fully considered but they are not persuasive.

The applicants argue that Ito et al is directed to a heat exchanger such that the device requires that these ceramic segments to have a high density ceramic member capable of providing a high heat capacity as a whole, and it is believed that to avoid any compromise to their high heat capacity, the foaming agent must be used in a minimal amount in adjusting its Young's modulus of the bonding material for bonding ceramic matrix segments.

The examiner disagrees.

Because the Young's modulus of the bonding body can range between 0.4 times to not more than 1.8 times the matrix segment such that with a Young's modulus of 0.4 times that of the matrix would allow for a large amount of foaming agents resulting in a large number of pores (see Ito et al page 3, lines 8-14).

The applicants disclose that the lower limit of the content of the above-mentioned foaming agent and the like is desirably set to 0.01% by weight, more desirably, to 1.0 by weight (see applicant's disclosure, page 49 line 25 through page 50, line 6) such that it only a small amount of foaming agent produces enough pores for adjusting a thermal capacity per unit volume of said adhesive layer such that said thermal capacity per unit volume of said adhesive layer is lower than a thermal capacity per unit volume of the porous ceramic members.

The applicants argue that Ito et al does not inherently disclose an adhesive layer having pores adjusting its thermal capacity per unit volume to be lower than the porous ceramic members.

The examiner disagrees.

Ito et al allows for a large addition of foaming agent with a Young's modulus of 0.5 times that of the ceramic matrix (see page 3, lines 8-14) resulting in a large number of pores which in turn would adjust its thermal capacity per unit volume to be lower than the porous ceramic members.

The applicants argue that nowhere does Naruse et al mention or suggest the thermal capacity per unit volume of an adhesive layer and the thermal capacity per unit volume of porous ceramic members, nor is Naruse et al believed to identify their thermal capacity per unit volume as a parameter for any improvement.

The examiner agrees and feels that Ito et al overcomes those deficiencies.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATASHA YOUNG whose telephone number is 571-270-3163. The examiner can normally be reached on Mon-Thurs 7:30 am-6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/N. Y./

Examiner, Art Unit 1797

/Walter D. Griffin/

Supervisory Patent Examiner, Art Unit 1797